



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/217,183	12/21/1998	VERNE C. HORNBECK	98-027	8652

24319 7590 04/10/2002

LSI Logic Corporation
1551 McCarthy Blvd.
M/S: D-106 Patent Department
Milpitas, CA 95035

EXAMINER

LAUCHMAN, LAYLA G

ART UNIT PAPER NUMBER

2877

DATE MAILED: 04/10/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/217,183

Applicant(s)

HORNBECK ET AL.

Examiner

Layla G. Lauchman

Art Unit

2877

-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 1-23-02.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 27-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 5-10 is/are allowed.
- 6) ☐ Claim(s) 1-4, 11, 12 and 27-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Specification

The disclosure is objected to because of the following informalities:

The term "graded index of refraction" is a well-established term in the art for an index of refraction continuously varying within the same material, or within layers of different materials fused together. However, in the application, the graded index of refraction has a different meaning: the indices of refraction are graded in a step-wise relation. Each material—the dielectric material, refractive layer, and core—has its own constant index of refraction, and there is no evidence of a gradual change of the index of refraction.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 11, 12, 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al (US 5,281,305) in view of common knowledge in the art.

As to Claims 1-4, and 12, Lee teaches an optical waveguide that has one layer of dielectric material 10 (silicon dioxide) positioned on a substrate (not shown in Fig. 1) defining a trench 16 (Fig.2) having side walls, the dielectric material having index refraction; a refractive layer 18 of optically transmissive material (borosilicate glass)

adjoining the side walls within the trench and conforming to the side walls, the refractive layer having an index of refraction; and a core 20 (PSG-phosphosilicate glass) of optically transmissive material adjoining the refractive layer within the trench and conforming to the refractive layer (Fig.6), the core having an index of refraction. The refractive layer surrounds the core except on one side; and the dielectric material 23 (Fig.6) contacts the core on the one side where the refractive layer does not surround the core. The refractive layer 18 is U-shaped and surrounds the core except on the one side. Fig. 8 shows that the borosilicate layer (18 and 28) completely encircles the core PSG. A cap 28 of the refractive material 28 (see Fig. 9) extends across the one side of the core 20 between the ends of the U-shaped refractive layer 18. The cap 28 has essentially the same index of refraction as the U-shaped refractive layer 18; and the cap and the U-shaped refractive layer encircling the core 20. Lee's waveguide does not indicate that the index of refraction of PSG is greater than the index of refraction of the layer 18, and the index of refraction of the layer 18 is-greater than the index of refraction of the layers 10 or 23. However, it is common knowledge in the art that in a typical waveguide structure the index of refraction of a core is greater than the index of refraction of the cladding material surrounding the core. It would have been obvious to one of ordinary skill in the art to have graded index of refraction as claimed in the invention of Lee in order to refract a greater amount of light energy into the core, rather than allowing the light energy to be lost in the surrounding dielectric material.

As to Claim 11, the refractive layer 18 is deposited within the trench.

As to Claims 27-29, the core 20 is deposited within the refractive layer 18, and the core 20 and the refractive layer 18 are located within the trench.

Allowable Subject Matter

Claim 5 is allowable. Claims 6-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: As to Claim 5, the prior art or record fails to show all the elements as presently claimed, wherein the second refractive layer is adjoining and conforming to the first refractive layer within the trench.

Response to Arguments

Applicant's arguments filed 1-23-02 have been fully considered but they are not persuasive in view of the abovementioned objections.

The page 15 of the application describes the "graded index of diffraction" as follows":

Because of the "graded" indices of refraction obtained by the relatively higher index of refraction of core material 32, the relatively intermediate index of refraction of the refractive material 30 and the relatively lower index of the refraction of the dielectric material 26, only a small portion of the light energy enters the dielectric material 26 and is lost.

This definition of the graded index of refraction does not comply with the well-established definition of the graded index of refraction that is continuously varying within the same material, or within layers of refraction of different materials fused together. The patent to O'Connor clearly describes a diffusion process, wherein a portion of the lower index material diffuses into the top side of the core sheet having a higher index of refraction. There is no evidence in the specification of the application of any type of continuity in the different materials. The indices of refraction are graded or changed in a step-wise relationship. Other examples of the conventional definition of the graded

index of refraction are in the patents to Colas et al (US 4,919,504) and Chern et al (US 4,545,646). In particular, Chern teaches a process of forming a continuously graded index optical material.

As to the Applicant's request to cite legal authority to support the objection, it is the following:

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

While applicant may be his or her own lexicographer, a term in a claim may not be given a meaning repugnant to the usual meaning of that term. See *In re Hill*, 161 F.2d 367, 73 USPQ 482 (CCPA 1947).

In regards to the 103 rejection, Examiner asserts that the invention of Claim 1, which is encompassed by the limitation "the index of refraction of the core is greater than the index of refraction of the refractive layer,...", is a common knowledge in the art. Another illustration of the applicant's limitation is in the patent (US 5,235,663) to Thomas. Thomas teaches an optical interconnect on integrated circuits. The interconnect comprises: a core member having a first predetermined index of refraction and a cladding layer having a second predetermined index of refraction, wherein the first predetermined index of refraction is greater than the second index of refraction.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Bornstein et al (US 4,867,544) discloses an optical glass element having a graded index or refraction. DiMarcello (US 4,076,380) et al discloses

a graded index optical fiber. Dabby et al (US 3,923,373) describe a transparent dielectric member having a graded index of refraction. All these references are examples of the customary meaning of the term "graded index of refraction."

Papers related to this application may be submitted to Technology Center 2800 by facsimile transmission. Papers should be faxed to TC 2877 via the PTO Fax Center located in CP4-4C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CP4 Fax Center number is (703)308-7722 or 308-7724.

If the Applicant wishes to send a Fax dealing with either a Proposed Amendment or for discussion for a phone interview then the fax should:

a) Contain either the statement "DRAFT" or "PROPOSED AMENDMENT" on the Fax Cover Sheet; and

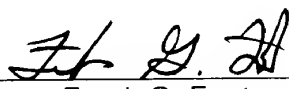
b) Should be unsigned by the attorney or agent.

This will ensure that it will not be entered into the case and will be forwarded to the examiner as quickly as possible.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to L. G. Lauchman whose telephone number is (703) 305-0071.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC receptionist whose telephone number is (703) 308-0956.

L. G. Lauchman
Patent Examiner
Art Unit 2877
3/27/02/lgl



Frank G. Font
Supervisory Patent Examiner
AU 2877